

Plants

1-2: The student will demonstrate an understanding of the special characteristics and needs of plants that allow them to survive in their own distinct environments. (Life Science)

1-2.6 Identify characteristics of plants (including types of stems, roots, leaves, flowers, and seeds) that help them to survive in their own distinct environments.

Taxonomy Level: 1.1-A Remember Factual Knowledge

Previous/Future knowledge: In kindergarten (K-2.1), students recognized what organisms needed to stay alive (including air, water, food, and shelter). In 3rd grade, students will illustrate the life cycles of seed plants and various animals and summarize how they grow and are adapted to conditions within their habitats (3-2.1) and explain how physical and behavioral adaptations allow organisms to survive (including...seed dispersal, color, and response to light for plants). In 6th grade (6-2.4), students will summarize the basic functions of the structures of a flowering plant for defense, survival, and reproduction.

It is essential for students to know that plants have characteristics that help them to survive in their own distinct environments. These characteristics include:

Types of Stems

- Stems usually grow above ground. They support flowers and leaves and store food. They carry food and water up from the roots to the rest of the plant and food from the leaves to the rest of the plant.
- There are two types of stems:
 - *Woody stems* provide support and protection for the plant and are hard and tough. Woody stems are found in plants such as trees, shrubs, or vines.
 - *Not woody stems* are very soft, delicate, are usually green and can bend. Not woody stems are found in most flowering plants.

Types of Roots

- Roots hold plants in the ground, absorb water and nutrients, and store food.
- There are two types of roots:
 - A *taproot* is one long root, with smaller roots coming off it, used to reach far into the ground to find water. They make the plants hard to pull from the ground. Some examples of plants with taproots are dandelions, radishes, beets, and carrots.
 - *Fibrous roots* do not have one long root, but have many smaller roots that come off the stem and grow closer to the surface of the ground. They can get water and nutrients quickly from the soil. Grass is an example of a plant with fibrous roots.

Types of Leaves

- Leaves use sunlight to make food for the plant.
- Leaves vary in their sizes, shape, and patterns. The many variations in leaves provide for better survival in specific habitats.
- For example, thick leaves minimize water loss, waxy leaves allow water to run off so it does not sit on the leaf and cause it to rot, and narrow leaves lose less water than broad leaves.

Types of Flowers

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- The main purpose of the flower is to attract primarily insects so it can produce more seeds so that the plant can survive and make new plants.
- The colors and scents of the different types of flowers attract these insects.
- Flowers help the plant survive because seeds are produced in the flower.

Types of Seeds

- Seeds have special characteristics that help them survive in different environments.
 - Some can withstand high or low temperatures.
 - Some have the ability to grow in different types of soil.
- Plants use different methods to scatter their seeds in order for the plant to survive in distinct environments.
 - Some are carried in the fur of animals while others are carried by the wind.
 - Many different birds and other animals eat seeds, or eat the plants while the seeds are still on the plants, and then dispose of them many miles away through their body waste.
- Other characteristics of seeds that help plants to survive are their ability to withstand high or low temperatures or the ability to grow in different types of soil.

It is not essential for students to use terminology such as herbaceous for non-woody stems, or annual and perennial for a plant's growth cycle. Monocot and dicot as types of seeds is also not essential.

Assessment Guidelines:

One objective of this indicator is to *identify* characteristics of plants that help them survive in their environments; therefore, the primary focus of assessment should be to recognize structures of plants that help them survive. However, appropriate assessments should also require students to *recall* the function of plant parts; *recognize* drawings or diagrams of types of plant parts; or *recognize* whether a plant could survive in its distinct environment as pictured or described.